

# Introducing New Mobile Intel Pentium® II processor and Mobile Intel Celeron™ processor!



January 25, 1999

**Robert M. Jecmen**

Vice President, Intel Architecture Business Group  
General Manager, Mobile & Handheld Products Group  
Intel Corporation



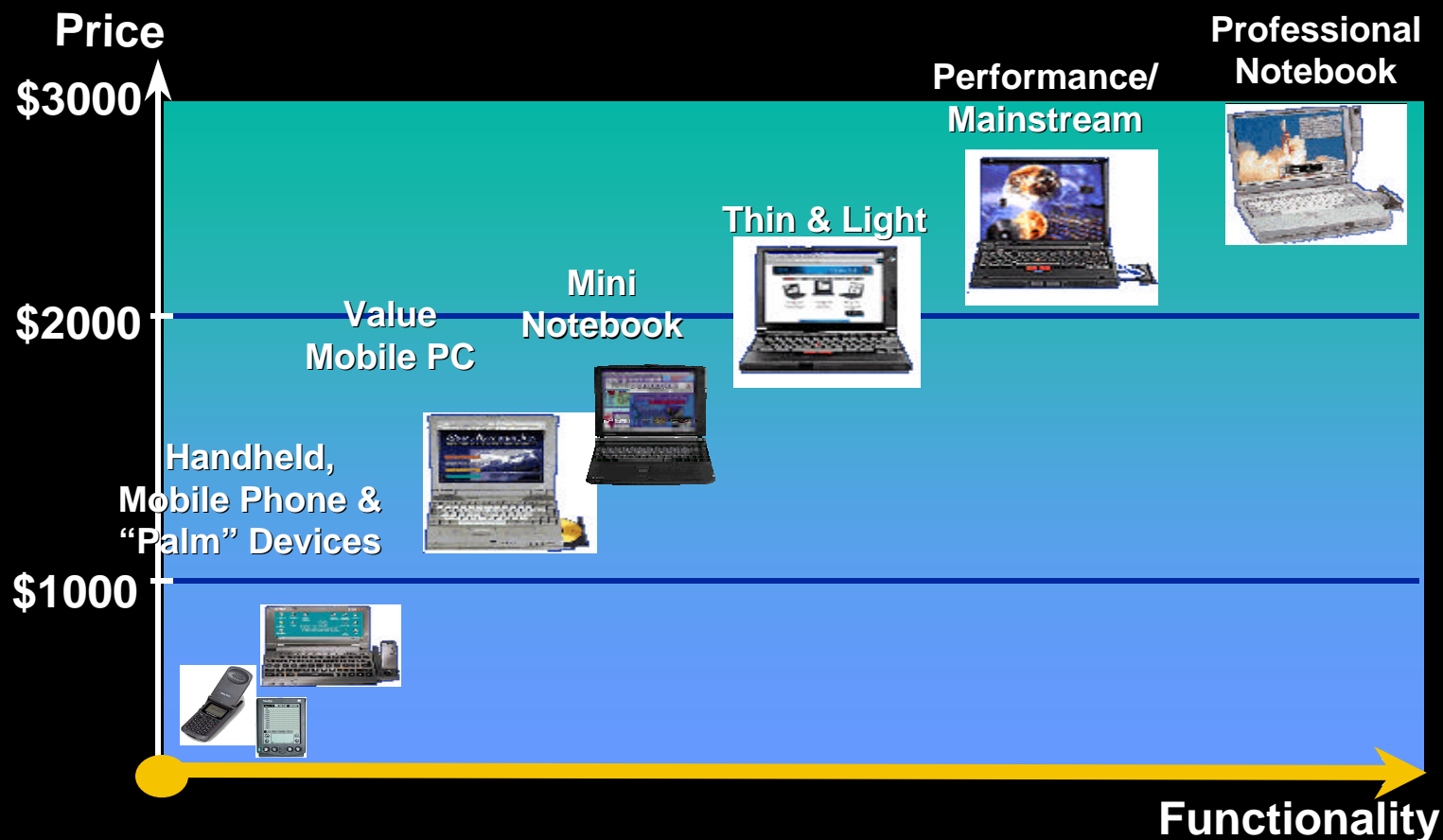
# It's a Mobile World !

- Mobile PC usage is growing
- Mobile PCs are appearing on more office desktops
- Home use is growing
- Business is providing more flexibility to workers



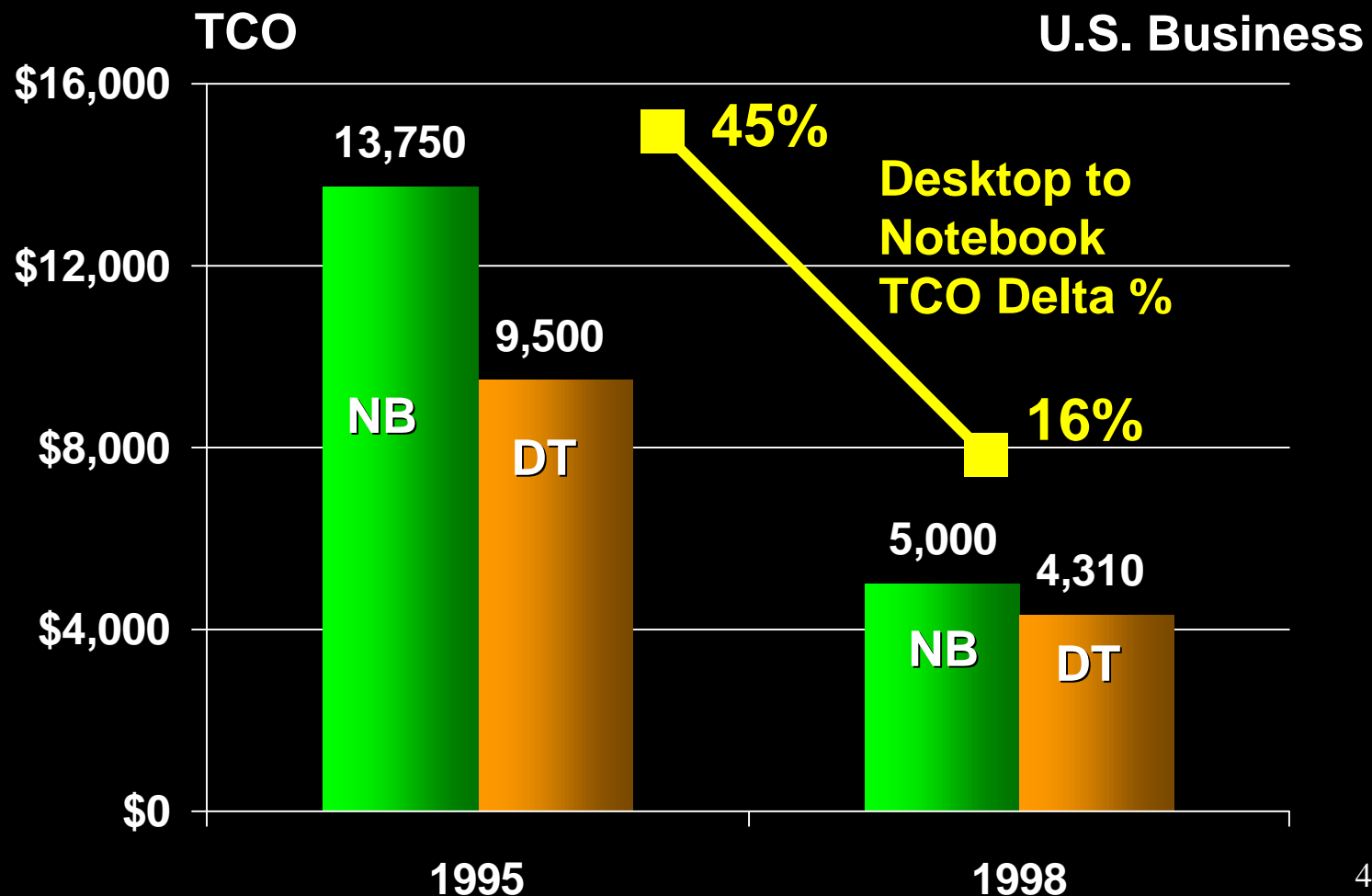
**A Transformation is Taking Place**

# Growing Mobile Choices



- Performance is up
- Prices down
- Smaller & lighter
- Richer feature sets

# Dramatic Drop in Total Cost of Ownership



# Changing The Business Computing Landscape

**“IT managers are looking at portable PCs as a strategic asset for their organization. They are deploying them not only to mobile workers, but also to many non-mobile workers.”**

**J. Gerry Purdy, Mobile Insights, Inc.**

**“We decided to move our mix to 80% notebook over the next couple of years ... to make Intel, a 65,000 employee company, move like a cheetah.”**

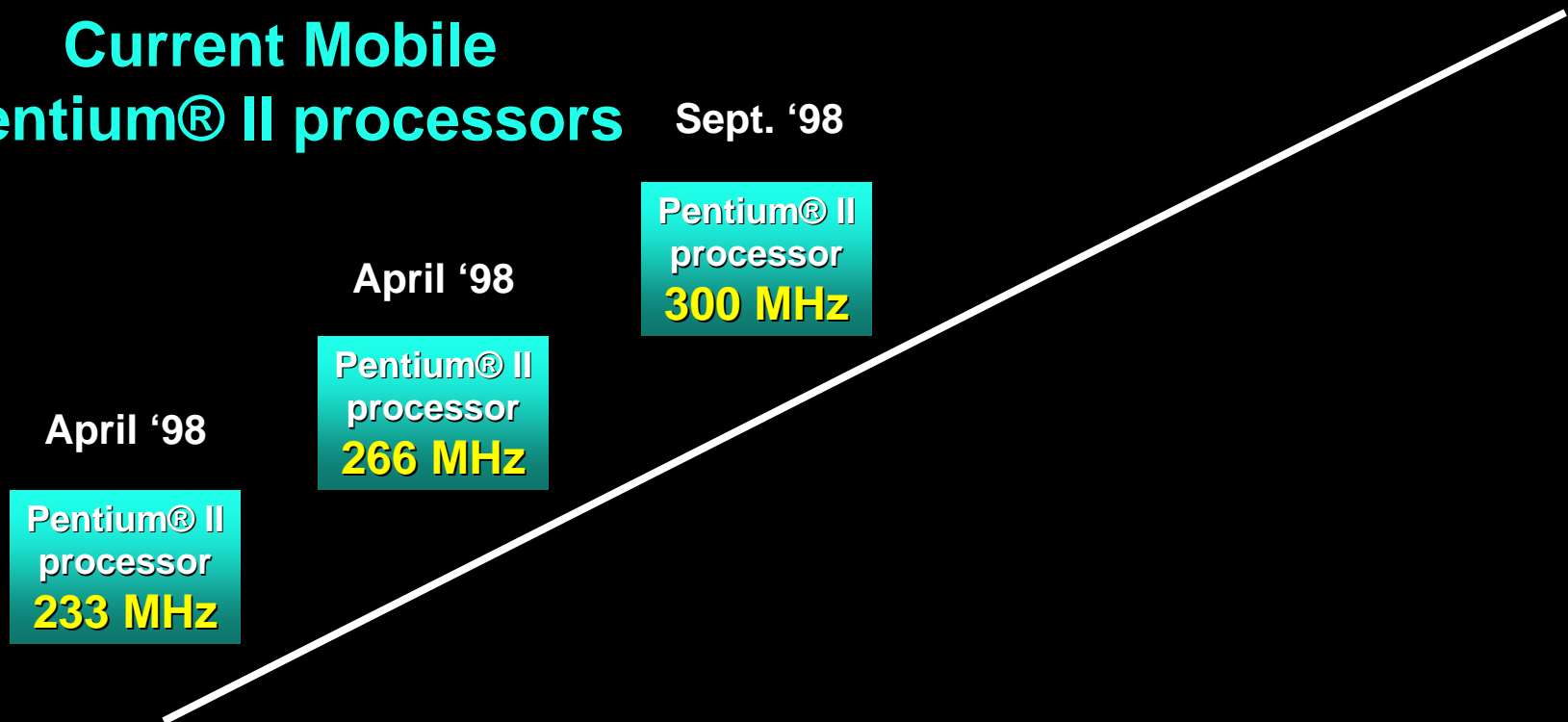
**Louis Burns, Intel Corp.**

**“100% of our work force has a laptop computer ...  
... to be nimble and responsive to our customers.”**

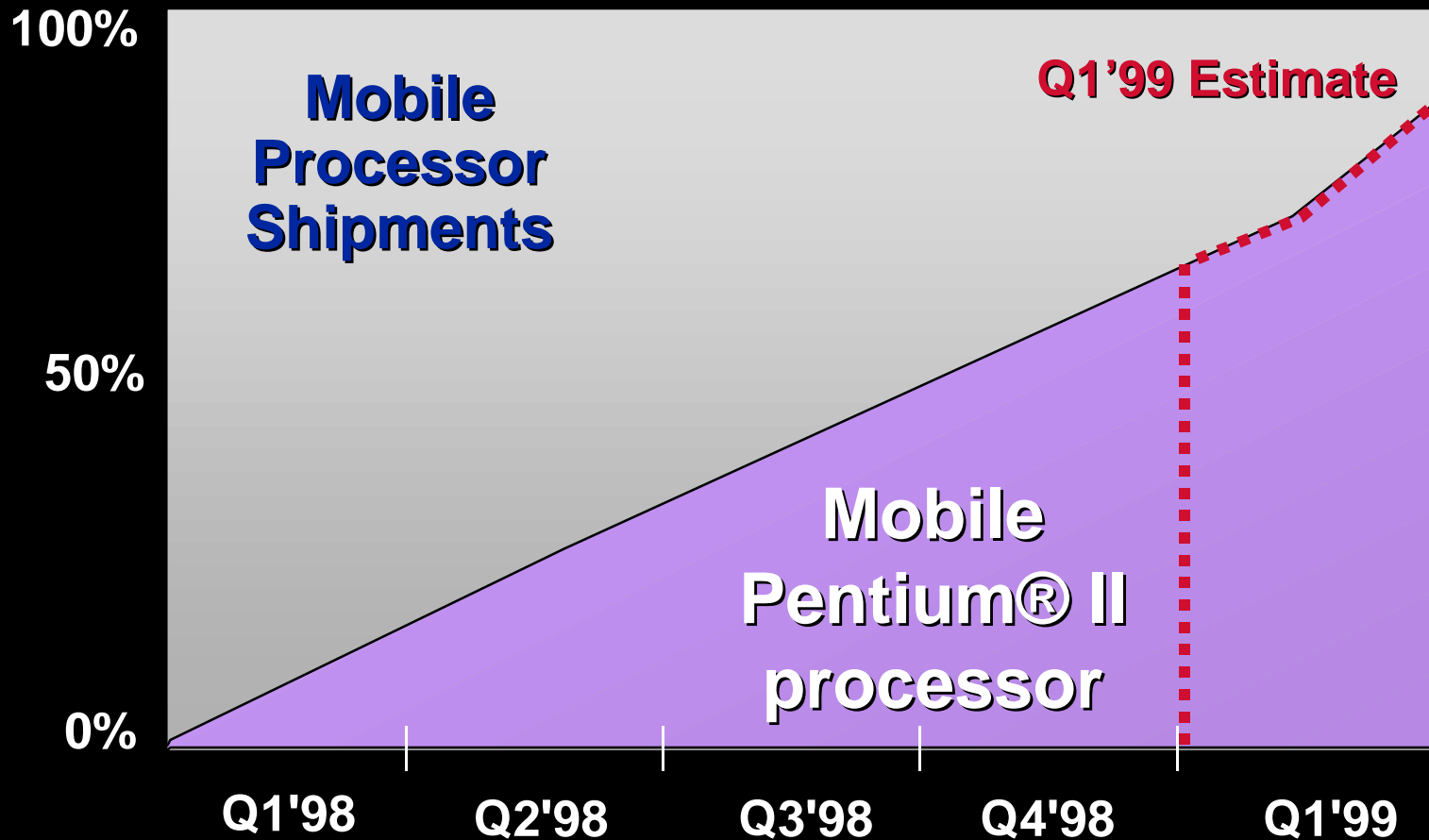
**Steve Zarate, PeopleSoft**

# Mobile Pentium II processor Family

**Current Mobile  
Pentium® II processors**



# Rapid Conversion to Mobile Pentium® II processor



Source: Intel 1/99

# Extending the Family

## New Mobile Pentium II processors

Jan. '99

Pentium® II  
processor  
**366 MHz**

Jan. '99

Pentium® II  
processor  
**333 MHz**

Sept. '98

Pentium® II  
processor  
**300 MHz**

April '98

Pentium® II  
processor  
**266 MHz**

April '98

Pentium® II  
processor  
**233 MHz**

Jan. '99

Intel® Celeron™  
processor  
**300 MHz**

Jan. '99

Intel® Celeron™  
processor  
**266 MHz**

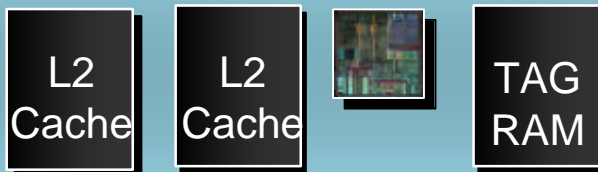
Using New Technology  
Mobile Intel Celeron processors  
for Value Segment

Intel - Designing Unique Products  
for Different Market Segments

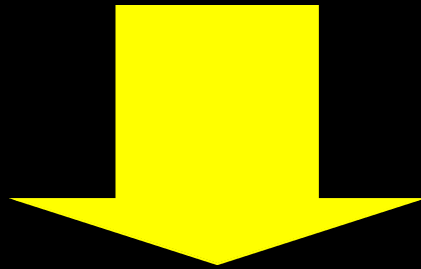


# New Intel® Mobile Processors

## Existing Mobile Pentium® II Processor



**7.5M Transistors  
(CPU Core)**



**Single Die Integration**

**27.4M Transistors**

- **First Intel Pentium® II processor on Single Silicon Die**
- **Highest number of transistors on an Intel processor**

# User Benefits - Performance

- New processors enable more performance through:
  - Frequency increase to 366 MHz
  - 3X faster cache access
- 27% increase over previous highest mobile - Pentium® II processor 300 MHz\*\* +

**Mobile Processor Performance has  
≅ Doubled in the Last Year! \*\* +**

\*\* Differences in hardware and software configurations will affect actual performance. For further information, refer to Performance Brief - Mobile Pentium® II processor 366, 333, 300PE & 266PE MHz, January 1999 and Performance Brief - Mobile Intel® Celeron™ processor 300 and 266 MHz, January 1999. These performance numbers were obtained by comparing mobile Pentium II processors in a commercially available Pentium II processor-based system and with a mobile Pentium® processor with MMX™ technology 266 MHz with the following configurations. Configuration: OEM A, system 1 with Pentium II processor 300, 266 and 233 MHz with 512K of L2 cache and with Pentium II processor 366, 333, 300PE and 266PE MHz with 256K of on-die L2 cache, both with 64MB SRAM, DVD ROM, 440BX chipset, Trident\* 9385DVD graphics controller, 8.1GB hard disk drive, DirectX\* 6, Windows\* 98 for Winstone\*99, MultimediaMark\* 99, 3DMark\*99 CPU and Windows NT 4.0 for SPECint95\* and SPECfp95\*. OEM B, system 1 with Pentium® processor with MMX™ technology 266 MHz with 512K of L2 cache, 64MB SRAM, 8XCD ROM, 430TX chipset, CT65554 graphics controller, 2.1GB hard disk drive, DirectX\* 6, Windows\* 98 for Winstone\* 99, MultimediaMark\* 99, Winbench98\* FPU, Windows NT\* 4.0 for SPECint95\* and SPECfp95\*.



+ Based SPECfp95 benchmarks. See system configurations above.  
\* All other names and brands are the property of their respective owners.

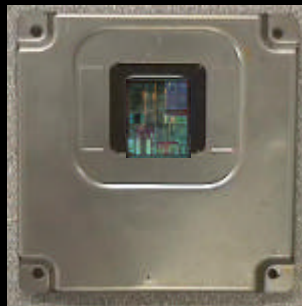
# Why Performance?

- Responsive mobile computing
- Fastest systems for current and future O/S', applications and the Internet
- High quality graphics, video and audio
- Supports emerging mobile applications
  - Compression/ Decompression
  - Encryption
  - Voice recognition
- Investment protection for long life

# User Benefit - New Packaging

- **Intel Ball Grid Array (BGA) Packaging**
  - Approx. 1/10th inch high, lighter than a Nickel

**Mobile Mini Cartridge**



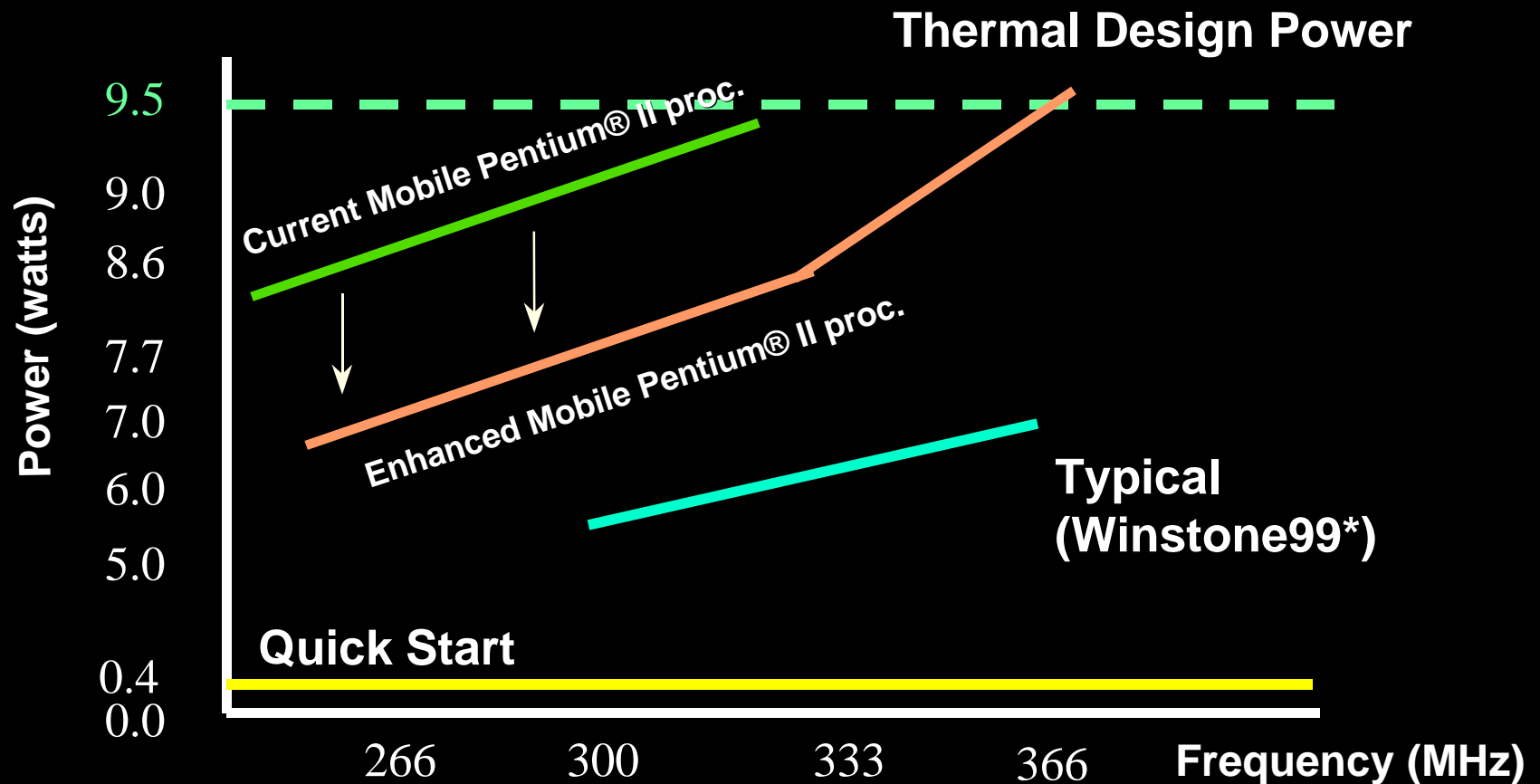
**Ball Grid Array  
BGA**



**New BGA Package  
86% Smaller and 89% Lighter**

**Mobile Pentium II processor moves to  
thinnest & lightest notebooks**

# User Benefits - Low Power +



≈ 15% Less Power Consumption @ Same Frequency ++



+ All Core Voltage is 1.6 volts

++ Mobile Pentium® II processor 300PE MHz (7.7 W) vs. 300 MHz (9.0W)

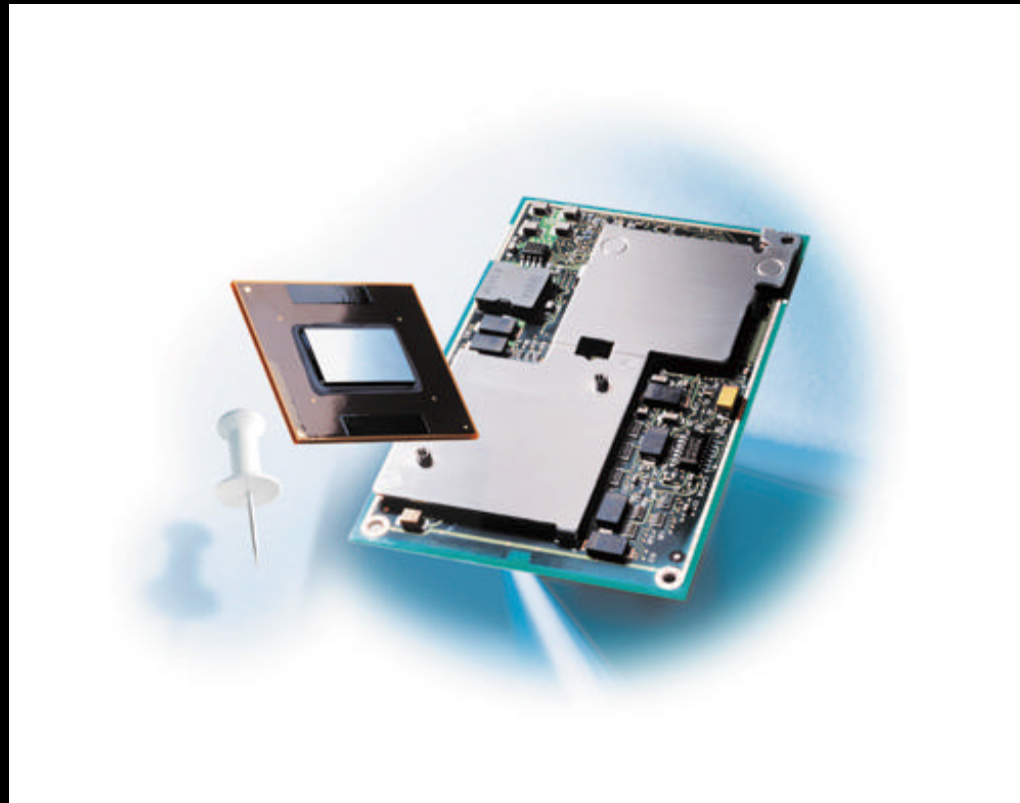
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# **Pentium® II Processor Systems Launching or Expected to Launch Soon**

- Acer
- AST Computer
- AMS Tech\*
- Compaq\*
- Dell Computer\*
- Fujitsu\*PC
- Gateway Computer\*
- Hewlett-Packard\*
- Hitachi\* PC
- IBM\*
- MAG Portable\*
- Micron\* Electronics
- NEC Computer Sys. Div.\*
- Quantex\*
- Sony
- Toshiba America\*
- Transmonde\*
- WinBook\*

# Mobile Intel® Celeron™ processor

## Great Performance at Exceptional Value



**Mobile Intel Celeron processors at 300 and 266 MHz**  
**Responsive & Affordable for Mobile PCs**

# Mobile Intel® Celeron™ processor

- Speeds of 300 and 266 MHz
- Up to 58% Performance improvement over a Pentium® processor with MMX™ Technology at 266 MHz <sup>1</sup>
- 128K on-die Level 2 (L2) cache
- Same low power and packages benefits
- Based on Intel's P6 microarchitecture

<sup>1</sup> Differences in hardware and software configurations will affect actual performance. For further information, refer to Performance Brief - Mobile Intel® Celeron™ processor 300 and 266 MHz, January 1999

Source: Intel. These performance numbers were obtained by comparing comparable commercially available Intel Celeron processor 300 MHz system against a system containing a Pentium processors with MMX technology at 266 MHz. See configurations below.

Configurations: + OEM B, system 1 with Pentium® processor with MMX™ technology 300 and 266 MHz with 512K of L2 cache, 64MB SRAM, 8XCD ROM, 430TX chipset, CT65554 graphics controller, 2.1GB hard disk drive, DirectX\* 6, Windows\* 98 for Winstone\* 99, MultimediaMark\* 99 and Winbench98\* FPU. ++ OEM B, system 2 with Intel® Celeron™ processor 300 and 266 MHz with 128K of on-die L2 cache, 64MB SRAM, 20XCD ROM, 440BX chipset, MagicGraph\* 128XD graphics controller, 2.1GB hard disk drive, DirectX\* 6, Windows\* 98 for Winstone\*99, MultimediaMark\* 99, Winbench98\* FPU Windows NT 4.0 for SPECint95\* and SPECfp95\*.

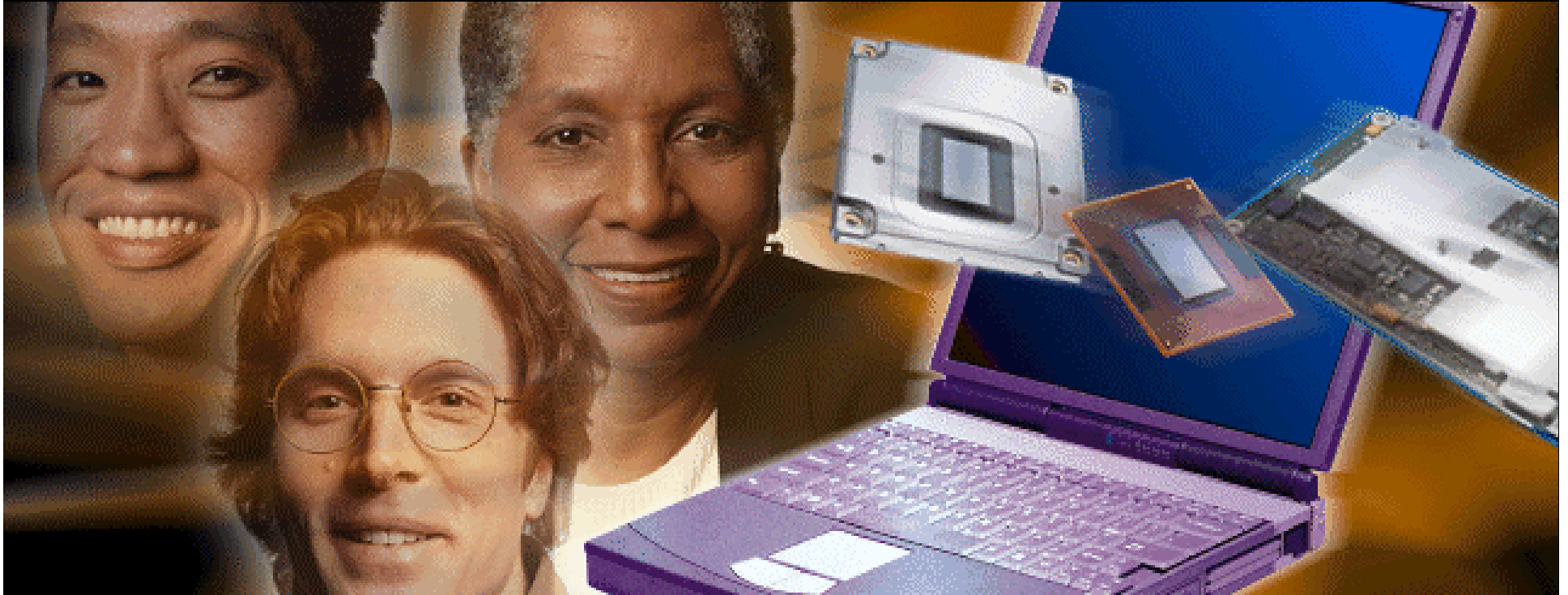


# Mobile Intel® Celeron™ Processor Systems

## Launching or Expected to Launch Soon

- AMS Tech\*
- Compaq \*
- Dell Computer\*
- Fujitsu PC\*
- Gateway Computer\*
- Hewlett-Packard\*
- IBM \*
- MAG Portables\*
- NEC Computer Sys. Div.\*
- Toshiba America\*

# What's coming next?



**More mobile technology from Intel!**

# Coming Later in 1999

- 0.18 micron process technology
  - Higher frequencies
  - Lower Power Consumption
- Mobile Pentium® III processor
- And more ...

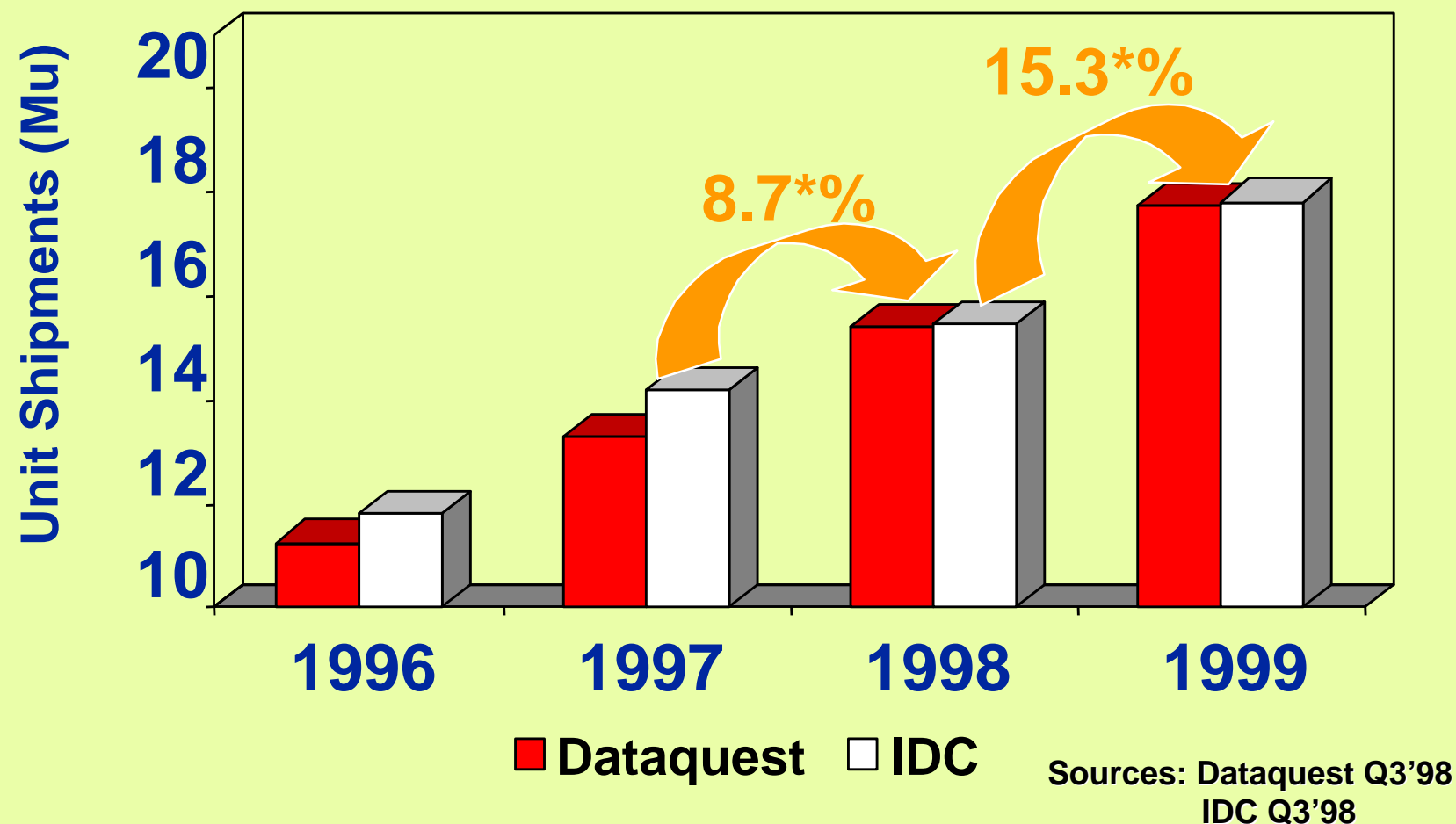
# Intel Corporation

## Meeting the needs of a Mobile World!



# Back-up

# Worldwide Mobile PC Forecast



# Mobile Processor Packaging

Processor	Mini Cartridge	Mobile Module	BGA
Pentium® II Processor 366-MHz	X	X	X
Pentium II Processor 333-MHz	X	X	X
Pentium II Processor 300PE-MHz	X	X	X
Pentium II Processor 266PE-MHz	X	X	X
Pentium II Processor 300-MHz	X	X	
Pentium II Processor 266-MHz	X	X	
Pentium II Processor 233-MHz	X	X	
Celeron™ Processor 300-MHz		X	X
Celeron™ Processor 266-MHz		X	X
Celeron™ Processor 233-MHz		X	X

# Mobile Celeron Processors Specifications

Clock Speed	Voltage (Internal)	Voltage (External)	L2 Cache	Power Consumption*
300-MHz	1.6v	2.5v	128K On-die	7.7w
266-MHz	1.6v	2.5v	128K On-die	7.0w

\* Represents TDP (Thermal Design Power) Typical of core plus L2 cache

**Taking advantage of Intel Voltage Reduction Technology**



# Increase Frequency, Same 9.5 Watt Thermal Envelope

Clock Speed	Voltage (Internal)	Voltage (External)	L2 Cache	Power Consumption*
366-MHz	1.6v	2.5v	256K On-die	9.5w
333-MHz	1.6v	2.5v	256K On-die	8.6w
300PE-MHz	1.6v	2.5v	256K On-die	7.7w
266PE-MHz	1.6v	2.5v	256K On-die	7.0w
300-MHz	1.6v	2.5v	512K Off-die	9.0w
266-MHz	1.7v	2.5v	512K Off-die	8.6w

\* Represents TDP (Thermal Design Power) Typical of core plus L2 cache

**Lowest Core Voltage of any CPU, at highest level of Performance**

# Mobile Power Initiative

- **Goal:**

- Provide future mobile PCs that are high-performance, feature rich, and power efficient through a comprehensive industry program
- **What's New**
- **System Software**
  - ACPI systems available now
  - ACPI provides longer battery life than those using APM
- **Application Software**
  - Intel Power Monitor v3.1 simplifies development of power-friendly software in Win 98 and through ACPI
- **Platform Hardware**
  - Systems and components using the Intel Mobile Power Guidelines '99 are in development now
  - Intel Mobile Power Guidelines '00 provide targets for year 2000 systems